PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Marie Angelopoulos, et al.
Serial Number	:	09/346,353
Filing Date	:	July 2, 1999
Examiner	:	T. Yoon
Group Art Unit	:	1714
For	:	METHODS OF FABRICATING PLASTICIZED, ANTIPLASTICIZED AND CRYSTALLINE CONDUCTING POLYMERS AND PRECURSORS THEREOF

The Honorable Assistant Commissioner of Patents
Post Office Box 1450
Alexandria, VA 22313-1450

In response to the Official Action dated March 31, 2004, please consider the following remarks.

With respect to the above-identified application. Applicants request that the merits of the Terminal Disclaimer previously filed with respect to this application in view of Claims 1 and 2 of United States Patent 5,969,024 be considered as a power of attorney will be filed by counsel by separate correspondence.

The Examiner is respectfully requested to reconsider his rejection of Claim 24 in view of 35 U.S.C. 112. Claim 24 has been changed in this amendment to read: "...polyaniline ..."

Claims 1 - 16, 20, 22, 23, 25 and 40 - 42 have been rejected under 35 U.S.C. 102(b) as anticipated by Han or obvious under 35 U.S.C. 103(a) as obvious over Han, (United States Patent 5,171,478), Ikkala et al. (United States Patent 5,520,852) or Cao et al.(United States Patent 5,232,631). The Examiner has stated that prior rejections form the basis for his rejections in the instant Official Action (See page 5), so Applicants will make reference to them in attempts to respond to the rejections in this response.

The Examiner asserts that the cited art shows treatment of conducting polymers by plasticizers or solvents. The Examiner points to prior rejections as to the teachings found in the cited references to support his rejections. There is no teaching of isotropic electrical conductivity in these references and the materials of these references are not made in the same way as applicants' materials. There is no suggestion in these references that isotopic electrical conductivity can exist in an electrically conductive polymer.

The Examiner, in prior rejections, commented on Example 6 pointing to where Han teaches stretch orientation and contends that Han teaches the use of a plasticizer and a solvent. The Examiner has totally ignored the rest of the limitations in Applicants' claims as rejected (1-16, 20, 22, 23 25, 40 - 42) for which there is no teaching or suggestions in Han and Cao et al.

Applicants' claims distinguish over Han in that Applicants include limitations which are not found in Han which render the subject matter patentable.

As to Claims 1-16, 20, 22, 23, 25 and 40 - 42 the Examiner has said previously, with respect to Han and Cao:

"The recited plasticizers of Han would not substantially dissolve polyanilines in the absence of a solvent, and would provide local mobility to polyanilines. The recited plasticizers of Han would not substantially dissolve in polyanilines [n]either.The recited plasticizers of Cao would not substantially dissolve polyanilines in the absence of a solvent, and would provide local mobility to polyanilines. The recited plasticizers of Cao

et al. would not substantially dissolve in polyanilines."

In these statements the Examiner acknowledges that neither Han nor Cao et al. teach using a solvent as claimed by applicants.

A way of determining what the Exaimer's position is with respect to the claims is to consult with the Board's in the recent Appeal decision where it stated:

"Appellants' method as set forth in claim 1 only requires the admixing of 'a solvent', 'an additive' and 'a polymer.' In Example 6, Han 'admixes' N-methyl pyrrolidinone, one of appellants' preferred 'solvents', tripropylamine, a 'plasticizer' ('additive') and an electrically conductive polyaniline, 'a polymer.' Han also teaches partial or substantial removal of the 'solvent.' Cao teaches the admixing of a polyaniline polymer with xylene, 'a solvent' and dodecylbenzene sulfonic acid, one of appellants' 'plasticizers'. Cao teaches removal of the solvent by conventional solvent removal methods."

In the passage quoted above, the Board refers to "N-methyl pyrrolidinone" as one of Appellants' preferred solvents and to tripropylamine as a "plasticizer". In this statement the Board is mixing the terminology used by Han, with the terminology used by Appellants. Han discloses only "plasticizers." Han refers to "tripropylamine" at col. 6, line 64 as "Illustrative of useful plasticizing agents" see col. 6, line 46, and further refers to"N-methyl pyrrolidinone at col. 7, line 64 as one of the "preferred plasticizing agents." (See col. 7, line 47). Although Applicants refer to "N-methyl pyrrolidinone" as an example of a solvent, Applicants' specification makes no mention of "tripropylamine." From the perspective of accuracy, the Board's statement above should have said that Han's example 6 teaches, (using Han's terminology), "a preferred plasticizer," e.g., N-methyl pyrrolidinone, and a plasticizer (of lesser preference), as illustrated by the compound "tripropylamine."

Han does not teach, as is claimed by Applicants, "a solvent" and an "additive to provide local mobility to said polymer to allow said polymer to associate with one another to achieve a crystalline-state" as claimed in claim 1.

Han has no teaching that N-methyl pyrrolidinone acts functionally different from tripropylamine. Whereas Appellants' claim 1 defines a significant unexpected distinction between the solvent and the additive.

The Board further stated that:

"Because appellants form an admixture from the same ingredients as used in the prior art and because appellants subject their admixture to the same processing steps, that is, admixing of the ingredients with subsequent removal of "solvent" as does the prior art, it is reasonable to conclude that appellants' method and the products obtained by appellants' method are the same... Citing In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977). "

The Board states that it is

"reasonable to presume prior art products and claimed products are identical or substantially identical where they are produced by the same or substantially the same processes."

Applicants disagree. As stated above, Applicants do not "form an admixture from the same ingredients as those used in the prior art" and thus Applicants' process is not substantially the same as the prior art.

The Board also stated:

"Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product .... Whether the rejection is based on 'inherency' under 35 USC 102, or 'prima facie' obviousness' under 35 USC 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products." [footnotes and citations omitted]

As stated above, there is no teaching, suggestion for or motivation for Applicants' invention and thus there is no showing of *prima facie* obviousness. There is no rejection

in the record based upon inherency and inherency can not support an obviousness rejection, since what is inherent in a reference is not taught by the reference.

Elsenbaumer as a reference, does not anticipate nor render obvious the present invention. Appellants' emphasize, as has been stated, that their invention is a method of forming an admixture of solvent, an additive and a polymer which is either a precursor to an electrically conductive polymer or an electrically conductive polymer wherein the solvent is removed or partially removed and the additive provides local mobility to the polymer to allow the polymer chains to associate tightly with one another to achieve a high crystalline state.

Elsenbaumer discloses a method of using a solution to form a conducting polymer. He discloses polyaniline in combination with an oxidizing dopant. He illustrates the useful dopants by disclosing a list of compounds, a substantial number of which are halogen-containing compounds. His preferred dopants are chlorine and bromine-containing compounds with the most preferred dopant being $FeCl_3$.

Elsenbaumer uses his dopant to modify the electrical properties of the polymer. This is an inherent difference in kind as compared with the present invention. Appellants have emphasized in the specification (page 11) that the morphology of a polymer is very important in determining the polymer's physical, mechanical and electronic properties. Appellants specifically state that prior art polyaniline base films of the type disclosed by Elsenbaumer are amorphous and are depicted in Figure 5 of the drawings. The drawings confirm the amorphous nature of the polymers. Applicants submit that their invention is an improvement over the typical Elsenbaumer doped polymer. Appellants have obtained an unexpected benefit as a result of their discovery that the additive provides local mobility to the polymer to allow the polymer chains to associate tightly with one another to achieve a high crystalline state. Applicants have

distinguished over the Elsenbaumer reference by virtue of the experimental data disclosed in the specification on page 12 as supported by Figure 5 of the drawings.

Applicants state at page 12 of the specification:

> Doping the amorphous polyaniline base films (those having structure shown in Figure 5a) with aqueous hydrochloric acid results in isotropic conductivity of 1S/cm. Such films are not crystalline. ...It should be noted that some level of crystallinity is lost during the doping process in these films." (Emphasis added)

Thus, Applicants have provided experimental data (under oath) that clearly establishes and supports the necessary difference in kind rather than degree of the oxidant that they use as opposed to the dopant of Elsenbaumer under similar conditions. The preferred $FeCl_3$. species in solution of Elsenbaumer provides the Cl^- ions analogous to the HCl used by Appellants in their comparative evaluation. The enhanced crystallinity (one of the objects of the invention) enhances the electrical properties and renders the Applicants' invention an unexpected improvement. Accordingly Claim 41 is patentable over Elsenbaumer.

Claim 42 which is dependent upon Claim 12 covers

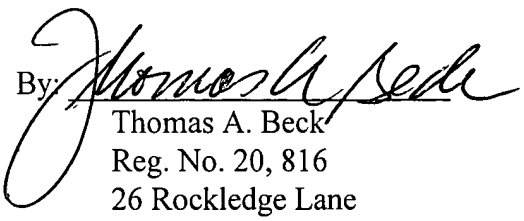
> A method comprising:
> providing solution of polymers in a solvent;
> said polymers are selected from the group consisting of precursors to electrica1ly conductive polymers and electrically conductive polymers;
> providing mobility to said polymers to allow said polymers to associate with one another
> to achieve a crystalline state by adding a plasticizer to said solvent;
> said plasticizer being soluble in said solvent. said plasticizer not being substantial1y soluble in said polymer in the absence of said solvent.

wherein the plasticizer is an oxidant.

The arguments submitted hereinabove relating to the patentability of Claim 41 are hereby incorporated by reference with respect to Claim 42. The data found in the specification supports Appellants assertion that the plasticizer-oxidant provides a result that is different in kind rather than degree.

Applicants submit herewith an RCE form for refiling this application in the event the claims are not found to be allowable.

Respectfully submitted,

By: 

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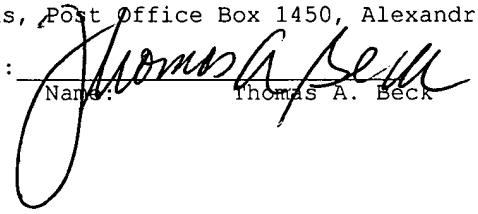
Signature:  Date: June 30, 2004

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